

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1-10. (cancelled)

Claim 11 (original): A surface inspection apparatus comprising:

an illumination source for directing a light beam onto a workpiece to generate scattered light that includes light scattered from defects of the workpiece and light scattered in accordance with the ordinary scattering pattern of the workpiece;

a programmable light selection array positioned to receive light scattered from the workpiece and direct the light onto a first photodetector array;

the first photodetector array is positioned to receive the light from the programmable light selection array and capable of translating the light into an associated electrical signal;

circuitry for receiving the associated electrical signal and determining which portion of the light scattered from the workpiece comprises the ordinary scattering pattern of the workpiece;

the programmable light selection array further selectively directs the light scattered from defects of the workpiece onto a photosensor where it is translated into an associated defect signal; and

processing circuitry for receiving the defect signal and using it to conduct surface analysis of the workpiece.

Claim 12 (original): The tool of Claim 11 wherein the programmable light selection array comprises an array of reflector elements that are selectively enabled to *direct* the light scattered from the workpiece onto the photosensor.

Claim 13 (original): The tool of Claim 12 wherein array of reflector elements comprises an array of MEMS reflector elements.

Claim 14 (original): The tool of Claim 12 wherein selected reflector elements of the array of reflector elements are actuated so that light scattered from the defects in the workpiece is selectively directed onto the photosensor and so that the light scattered by the non-defect

containing portions of the workpiece is not directed onto the photosensor.

Claim 15 (original): The tool of Claim 11 wherein the first photodetector array comprises at least two photodetector arrays and wherein the photosensor comprises at least two photosensors.

Claim 16 (original): The tool of Claim 11 wherein the workpiece comprises an un-patterned surface.

Claim 17 (original): The tool of Claim 16 wherein the un-patterned surface comprises a semiconductor wafer.

Claim 18 (original): The tool of Claim 16 wherein the un-patterned surface comprises a semiconductor wafer having at least one un-patterned layer of material formed thereon.

Claim 19 (original): The tool of Claim 16 wherein the workpiece comprises a semiconductor wafer having a surface formed by an epitaxial fabrication processes.

Claim 20 (original): The tool of Claim 16 wherein the workpiece comprises a semiconductor wafer formed using silicon germanium material.

Claim 21 (original): The apparatus of Claim 11 wherein the apparatus comprises a darkfield inspection tool.

Claim 22 (original): The apparatus of Claim 11 wherein the photosensor comprises a discrete photosensor element.

Claim 23 (original): The apparatus of Claim 22 wherein the photosensor comprises a plurality of discrete photosensor elements.

Claim 24 (original): The tool of Claim 22 wherein the programmable light selection array comprises an array of reflector elements that are selectively enabled to *direct* the light scattered from the workpiece onto the photosensor.

Claim 25 (original): The tool of Claim 24 wherein array of reflector elements comprises an array of MEMS reflector elements.

Claim 26 (original): The tool of Claim 24 wherein selected reflector elements of the array of reflector elements are actuated so that light scattered from the defects in the workpiece is selectively directed onto the photosensor and so that the light scattered by the non-defect containing portions of the workpiece is not directed onto the photosensor.

Claim 27 (original): The apparatus of Claim 11 wherein the photosensor comprises a second photodetector array.

Claim 28 (original): The tool of Claim 27 wherein the programmable light selection array comprises an array of reflector elements that are selectively enabled to *direct* the light scattered from the workpiece onto the photosensor.

Claim 29 (original): The tool of Claim 28 wherein array of reflector elements comprises an array of MEMS reflector elements.

Claim 30 (original): The tool of Claim 28 wherein selected reflector elements of the array of reflector elements are actuated so that light scattered from the defects in the workpiece is selectively directed onto the photosensor and so that the light scattered by the non-defect containing portions of the workpiece is not directed onto the photosensor.

Claim 31 (original): The apparatus of Claim 11 wherein the first photodetector array also operates as the photosensor.

Claim 32 (original): The tool of Claim 11 wherein the programmable light selection array comprises an array of reflector elements that are selectively enabled to *direct* the light scattered from the workpiece onto the photosensor.

Claim 33 (original): The tool of Claim 32 wherein array of reflector elements comprises an array of MEMS reflector elements.

Claim 34 (original): The tool of Claim 32 wherein selected reflector elements of the array of reflector elements are actuated so that light scattered from the defects in the workpiece is selectively directed onto the photosensor and so that the light scattered by the non-defect containing portions of the workpiece is not directed onto the photosensor.

Claim 35 (original): The tool of Claim 31 wherein the programmable light selection array comprises an array of filter elements that are selectively activated and deactivated to enable the light scattered from the workpiece to pass through the array of filter elements thereby directing the light scattered from the defects of the workpiece onto the photosensor.

Claim 36 (original): The tool of Claim 35 wherein array of filter elements comprises an array of LCD filter elements.

Claim 37 (original): The tool of Claim 35 wherein array of filter elements comprises an array of selectively activatable polarizer elements that can filter by polarization.

Claim 38 (original): An surface inspection apparatus comprising:

- an illumination source for directing a light beam onto a workpiece;

- a programmable light selection array positioned to receive light scattered from the workpiece, the programmable light selection array for directing said light onto to a photodetector element and also capable of selectively directing selected portions of the light onto to a photosensor element;

- the photodetector element being positioned such that it receives light from the programmable light selection array and translates said received light into an associated electrical signal;

- processing circuitry for receiving and analyzing the associated electrical signal from the first photodetector element and thereby determining an ordinary scattering portion of the of the light scattered from the workpiece that is associated with an ordinary scattering pattern of the workpiece and determining a defect portion of the light scattered from the workpiece that is associated with defects of the workpiece;

- control circuitry for activating and deactivating light selection elements of the programmable light selection array so that said selected portions of the light comprising the defect portion of the light scattered from the workpiece are selectively directed onto the

photosensor element that translates said defect portion into a defect electrical signal;

defect analysis circuitry for receiving and analyzing the defect electrical signal from the photosensor element to characterize defects the workpiece.

Claim 39 (original): The tool of Claim 38 wherein the workpiece comprises an un-patterned surface.

Claim 40 (original): The tool of Claim 39 wherein the un-patterned surface comprises a semiconductor wafer.

Claim 41 (original): The tool of Claim 39 wherein the un-patterned surface comprises a semiconductor wafer having at least one un-patterned layer of material formed thereon.

Claim 42 (original): The tool of Claim 39 wherein the workpiece comprises a semiconductor wafer having a surface formed by epitaxial fabrication processes.

Claim 43 (original): The tool of Claim 39 wherein the workpiece comprises a semiconductor wafer formed using silicon germanium material.

Claim 44 (original): The apparatus of Claim 38 wherein the photodetector element operates as the photosensor element.

Claim 45 (original): The apparatus of Claim 44 wherein the programmable light selection array comprises a filter array comprising a plurality of filter elements; and

wherein the control circuitry selectively activates and deactivates the filter elements such that the defect portion of the light is selectively directed onto the photosensor element and such that the ordinary scattering portion of the light is substantially blocked from the photosensor element.

Claim 46 (original): The apparatus of Claim 44 wherein the programmable light selection array comprises a reflector array comprising a plurality of reflector elements; and

wherein the control circuitry selectively actuates the reflector elements so that the defect portion of the light is selectively reflected onto the photosensor element and so that ordinary

scattering portion of the light scattered from the workpiece is selectively reflected away from the photosensor element such that substantially all of the ordinary scattering portion of the light is not detected by the photosensor element.

Claim 47 (original): The apparatus of Claim 38 wherein the photodetector element and the photosensor element are each comprised of different detector elements.

Claim 48 (original): The apparatus of Claim 47 wherein the photodetector element comprises a photodetector array comprising a plurality of photo-sensitive detector elements and wherein the photosensor element comprises a single discrete photo-sensitive detector device.

Claim 49 (original): The apparatus of Claim 48 wherein the single discrete photo-sensitive detector device that comprises the photosensor elements is selected from among the group of devices consisting of a photo-multiplier tube, a photodiode, and avalanche photodiode.

Claim 50 (original): The apparatus of Claim 48 wherein the programmable light selection array comprises a reflector array comprising a plurality of reflector elements; and
wherein the control circuitry selectively actuates the reflector elements to selectively direct the defect portion of the light scattered from the workpiece onto the photosensor element.

Claim 51 (original): The apparatus of Claim 50 wherein the wherein the control circuitry selectively actuates the reflector elements to selectively direct the ordinary scattering pattern of the light scattered from the workpiece onto the photodetector array.

Claim 52 (original): The apparatus of Claim 38 wherein the processing circuitry, the control circuitry, and the defect analysis circuitry are incorporated into a single electronic circuit element.

Claim 53 (cancelled).

Claim 54 (currently amended): ~~The method of Claim 53~~ A method for conducting surface inspection comprising:
providing a workpiece for inspection;

illuminating the workpiece to produce scattered light that includes light scattered from defects in the workpiece causing defect scatter and includes clusters of light scattered from non-defect portions of the workpiece that correspond to an ordinary scattering pattern of the workpiece;

~~wherein~~ selectively detecting the defect scatter ~~comprises~~ by:

detecting the scattered light;

determining which of the scattered light comprises the ordinary scattering pattern of the workpiece; and

after identifying the ordinary scattering pattern, selectively excluding a substantial portion of the ordinary scattering pattern from detection, thereby selectively detecting the defect scatter.

Claim 55 (original): The method of Claim 54 wherein analyzing the selectively detected defect scatter includes analyzing the defect scatter to characterize defects of the workpiece surface.

Claim 56 (original): The method of Claim 54 wherein

detecting the scattered light comprises detecting the scattered light such that two dimensional images of the scattered light are generated;

wherein determining which of the scattered light comprises the ordinary scattering pattern comprises analyzing the two-dimensional images to determine a spatial light distribution that corresponds to the ordinary scattering pattern of the workpiece; and

wherein selectively detecting the defect scatter comprises selectively detecting scattered light that does not form part of the ordinary scattering pattern of the workpiece.

Claim 57 (original): The method of Claim 56 wherein determining which of the scattered light comprises the ordinary scattering pattern comprises analyzing the two-dimensional images to determine a spatial light distribution that corresponds to the majority of the light and defining this distribution as the ordinary scattering pattern of the workpiece.

Claim 58 (original): The method of Claim 57 wherein the spatial light distribution that corresponds to the majority of the light is defined as a spatial light distribution pattern that contains at least about 80% of the detected scattered light.

Claim 59 (original): The method of Claim 57 wherein the spatial light distribution that corresponds to the majority of the light is defined as a spatial light distribution pattern that contains at about 99% of the detected scattered light.

Claim 60 (original): The method of Claim 57 wherein selectively detecting the defect scatter comprises selectively detecting scattered light such that an optimal signal-to-noise ratio is achieved for defect detection.

Claim 61 (original): The method of Claim 56 wherein selectively detecting the defect scatter is accomplished by selectively reflecting the light comprising the ordinary scattering pattern away from detectors used to detect the defect scatter such that the detectors detect defect scatter and do not detect substantially all of light of the ordinary scattering pattern.

Claim 62 (original): The method of Claim 61 wherein selectively reflecting the light comprising the ordinary scattering pattern away from detectors is accomplished by selectively actuating individual reflectors of a reflector array to reflect the light that comprises the ordinary scattering pattern away from detectors used to detect the defect scatter.

Claim 63 (original): The method of Claim 56 wherein selectively detecting the defect scatter is accomplished by selectively filtering the scattered light so that substantially all of light comprising the ordinary scattering pattern is prevented from reaching detectors used to detect the defect scatter.

Claim 64 (currently amended): The method of Claim 63 wherein selectively filtering the scattered light comprising comprises selectively activating individual filter elements of an **LED LCD** filter array thereby passing the light corresponding to the defect scatter and filtering the light comprising the ordinary scattering pattern such that substantially all of the light comprising the ordinary scattering pattern fails to reach the detector.